AMENDMENTS TO THE DRAWINGS

Please delete Figures 46-70.

The attached three sheets of drawings include changes to Figures 71-74. These sheets, which include Figures 71 and 72 (one sheet), 73 and 74, replace original sheets including Figures 71 and 72 (one sheet), 73 and 74. Due to the removal of Figures 46-70, Figures 71-74 have been renumbered as Figures 46-49.

Attachment: Replacement Sheets (3)

REMARKS

Please reconsider the application in view of the foregoing amendments and the following remarks.

Status of Claims

Claims 1-7, 9 and 10 are pending in the present application. Claims 1, 3 and 6 are herein amended. No new matter has been entered.

Drawings

The Office Action objects to the drawings stating that they contain duplicate figures.

Applicant herein cancels Figures 46-70. Figures 71-74 have been renumbered as Figures 46-49.

Also, Applicants respectfully point out that Fig. 23 is a little bit different from Fig. 13 and Fig. 25 is little bit different from Fig. 12. Similarly, Figs. 29, 30, 71 and 72 may appear but are not similar. As such, Applicants traverse the Office's objection as to these drawings.

Claim Objections

The Office Action has objected to the term "(referred to as the three-dimensional clothoid curve)" in claim 3, line 13.

The Office Action has also objected to the term "wherein seven parameters" in claim 6, line 2 and suggests that it should be amended to "wherein the seven parameters".

Applicants appreciate the Examiner's comments and herein amend claims 3 and 6 in order to overcome the objection.

Claim Rejections - 35 U.S.C. §101

The Examiner has rejected claims 1-7 under 35 U.S.C. 101 stating that the claimed invention is directed to non-statutory subject matter and that the method claims are not tied to a particular apparatus.

Applicant herein amends claim 1 to overcome this rejection.

As to the Merits

As to the merits of this case, the Examiner sets forth the following rejections:

Claims 1-2 and 9-10 were rejected under 35 U.S.C. 102 (b) as being anticipated by **Szu et al.** U.S. Patent No. 5,909,965.

Claim 3 was rejected under 35 U.S.C. 103(a) as being unpatentable over **Szu et at.** U.S. Patent No. 5,909,965 in view of **Drennen et al.** U.S. Publication No. 2002/0189385.

Claims 4-7 were rejected under 35 U.S.C. 103(a) as being unpatentable over **Szu et al.** U.S. Patent No. 5,909,965 in view of **Drennen et al.** U.S. Publication No. 2002/0189385 and in view of **Hirai et al.** U.S. Patent 6,587,747.

Each of these rejections is respectfully traversed.

Claim Rejections - 35 U.S.C. §102

Independent Claims 1, 9 and 10

Szu discloses generating spatial clothoidal curve (C7 L6-32). In order to generate the spatial clothoidal curve, Szu uses two mutually intersecting clothoidal surfaces (C6 L28-46). The clothoidal surface is defined as the surface formed by projecting a planar clothoidal curve uniformly along the normal direction of the plane of the planar clothoidal curve. Fig.7 shows an example resulting from the above designing method where the spatial clothoidal curve is formed by the line intersected by two clothoidal surfaces.

Szu discloses another method for generating spatial clothoidal curve. In this method, a planar clothoidal curve is developed into an assigned curved surface (e.g. a cylindrical surface) (C6 L47-54)

However, it is difficult to express the spatial clothoidal curve of Szu in the form of a formula. And the spatial clothoidal curve is not defined as each of a pitch angle and a yaw angle

in a tangential direction of the spatial clothoidal curve is given by a quadratic expression comprising of a curve length or a curve length variable.

The three-dimensional clothoid curve defined by above formula is conceived by the inventor for the first time. Defining the three-dimensional clothoid curve in the above formula makes the computer easily generate the three-dimensional clothoid curve.

Additional Explanation

The Examiner indicated that why "the curvature of clothoid curve varying continuously and proportionally linearly to its arc length from the initial point of the curve" does not implicitly disclose that each of a pitch angle and a yaw angle in a tangential direction of said three-dimensional clothoid curve is given by a quadric expression comprising of a curve length or a curve length variable.

The planer clothoid curve (called a Cornu curve) has a property that "the curvature of clothoidal curve varies continuously and proportionally linearly to its arc length from the initial point of the curve" as Szu disclosed (see col. 4 lines 65-67, col.5 lines 1-7). The spatial clothoid curve of Szu has a property similar to that of the planer clothoid curve. Also, the three-dimensional clothoid curve of this invention has a property similar to that of the planer clothoid curve.

However, the definition of the three-dimensional clothoid curve of this invention is quite different from that of Szu.

To define the spatial Clothoidal curve, Szu expands the planar clothoid curve into the cylindrical surface (col. 6, lines 47-54, Fig.8B)

And as another definition of the spatial clothoidal curve, Szu uses two mutually intersecting clothoid surfaces (col. 6, lines 28-46, Fig.7). The clothoid surface is defined as the surface formed by projecting a planar clothoid curve uniformly along the normal direction of the plane of the planar clothoid curve. The spatial clothoid curve is defined by the line intersected by two clothoid surfaces.

However, Szu fails to define the spatial clothoid curve in a form of a simple formula. Actually, the coordinates of the spatial clothoid curve may be calculated as numerical values, but a formula defining the spatial clothoid curve can hardly be made.

On the contrary thereto, the three-dimensional clothoid curve of this invention is defined as each of a pitch angle and a yaw angle in a tangential direction of the three-dimensional clothoid curve is given by a quadratic expression comprising of a curve length or a curve length variable.

The three-dimensional clothoid curve of this invention is defined by a simple formula. Defining the three-dimensional clothoid curve above is conceived by Applicant for the first time and it enables to bring following effect (1) and (2).

(1) In the case that two clothoid curves are mutually connected, it is sufficient to select parameters to permit tangential lines, normal lines, and curvatures to be continuous at their

connecting point. This selection manner will produce a one smoothly connected line, called a clothoid curve group (see paragraph [0115]).

(2) Because the tangential directions of curves can be swung with changing two angles (pitch angle and yaw angle), an arbitrary three-dimensional curve can be produced in conformity with various conditions for various applications (see paragraph [0116]).

In view of foregoing, Applicants respectfully submit that Szu does not teach or disclose the limitations as recited in claims 1, 9 and 10. Thus, Applicants submit that the rejection of claims 1-2 and 9-10 is improper and respectfully request that it be withdrawn.

Claim Rejections - 35 U.S.C. §103

Dependent claims 3 and 4-7 are also patentable by virtue of their dependency because they incorporate by reference the distinguishing feature of claim 1.

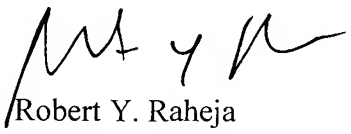
Conclusion

The Claims have been shown to be allowable over the prior art. Applicants believe that this paper is responsive to each and every ground of rejection cited in the Office Action dated June 9, 2009, and respectfully request favorable action in this application. The Examiner is invited to telephone the undersigned, applicants' attorney of record, to facilitate advancement of the present application.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP



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